GAGAN (GPS Aided GEO Augmented Navigation)

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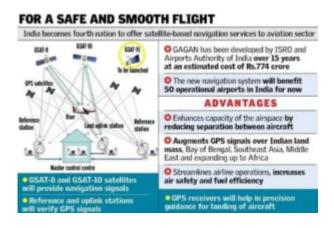
<u>In news-</u> In a first, an IndiGo-operated ATR 72-600 aircraft recently landed at Kishangarh airport, using an approach process guided by India's own satellite-based augmentation system named GAGAN, or GPS-aided GEO Augmented Navigation.

Key updates-

- With this trial landing at the small airport near Ajmer in Rajasthan, India joined a small group comprising the US, Japan and Europe with its own satellite-based augmentation system (SBAS).
- Other than GAGAN, the three space-based augmentation systems in the world are— US (WAAS) Europe (EGNOS) and Japan (MSAS).
- With ISRO's GAGAN, India has become the first country in the Asia-Pacific to successfully develop such a system for aviation use.
- The others under development include China's BeiDou SBAS, South Korea's Korea Augmentation Satellite System (KASS), Russia's System for Differential Corrections and Monitoring (SDCM), and the Southern Positioning Augmentation Network (SPAN) of Australia and New Zealand.
- The SBAS is a navigation system, which builds on the Global Navigation Satellite Systems (GLONASS), and adds to the accuracy and integrity of these navigation tools.
- For aircraft operators, both civilian and military, it means that pilots can land aircraft at smaller airports and airstrips using navigation guidance without expensive instrument-based landing systems being installed on the ground.

About GAGAN-

- GAGAN is an Indian Satellite Based Augmentation System (SBAS).
- This system has been developed by the AAI and the ISRO.
- It uses a constellation of satellites and a network of ground stations (in Delhi, Guwahati, Kolkata, Ahmedabad, Thiruvananthapuram, Bengaluru, Jammu and Port Blair) to provide necessary augmentations to the GPS standard positioning service (SPS) navigation signal for use in air traffic management.
- The ground stations strategically positioned across the country are used to collect GPS satellite data on aircraft position and movement.
- GAGAN is designed to provide accuracy and integrity necessary to enable reliance on GPS for all phases of flight from en route through approach, for all qualified airports within the covered zone.
- It will also provide increased accuracy in position reporting of aircraft, allowing for more uniform and high-quality air traffic management.



- It offers almost the same accuracy as a ground-based landing system comprising antennae and beacons that transmit signals to aircraft to help pilots land.
- It will enable aircraft to land even at smaller and regional airports not equipped with expensive groundbased landing systems.

- GAGAN can bring benefits in terms of saving fuel and equipment cost, flight safety, especially in adverse weather conditions and increased air space capacity, according to Isro.
- Its footprint extends from Africa to Australia and has expansion capability for seamless navigation services across the region.
- Though primarily meant for aviation, GAGAN will provide benefits to many other user segments such as intelligent transportation, maritime, highways, railways, surveying, geodesy, security agencies, telecom industry, personal users of position location applications etc.
- AAI in coordination with Indian National Centre for Ocean Information Services (INCOIS) has implemented GAGAN Message Service (GMS) through which alert messages to fishermen, farmers, and disaster affected people will be sent on the occurrence of natural disasters, calamities, such as flood, earthquake etc.